Pride and Prejudice and Zombies

Pride and Prejudice and Zombies, by Jane Austen and Seth Grahame-Smith, spices up the famous 1813 satire about marriage and social convention with intercalary appearances by zombies, skunks, ghouls, chipmunks and ninjas. Most literary critics praised PPZ (as it's known on Facebook) as "clever", "insightful", holding "indomitable appeal", although Macy Halford of The New Yorker condemned Mr. Grahame-Smith's retelling as "awful", and "one hundred per cent terrible".

Here's a little known fact: the book's release was delayed by some 8 years due to several heated disagreements between Mr. Grahame-Smith and the editors at Quirk Books, the small publishing house in Philadelphia that eventually published the novel. The most impassioned of the arguments centered on the controversial "Vampire Number" chapter, where Mrs. Bennett — desperate to rally the English countryside's interest in matrimony — contrives a social event where 50 men and 50 women draw slips of paper from a large, feathery hat. "It is an axiom generally acknowledged, that a single man in possession of the complementary multiplicand, must be in want of a wife", says Mrs. Bennett in announcing the event. On each slip of paper is a single three-digit number. The goal of the event was for each of the women to find the man whose three-digit number, when multiplied by her own, produced a six-digit number that reproduced the digits of the two "multiplicands" (Mrs. Bennett's word) with the correct "distribution" (also her word) in some order.

Mr. Grahame-Smith insisted the chapter was vital to the story arc, whereas Quirk Books considered it forced, obscure, boring, and unnecessarily intellectual. Furthermore, Quirk Books was initially contemplating a limited New England release and argued that no one outside of the Pacific Northwest understood math. Mr. Grahame-Smith eventually conceded this to be true, and agreed to cut the chapter. The chapter's existence only surfaced recently in a follow-up article in The New Yorker where Ms. Halford noted the novel would have "benefitted substantially" had it been included.

Vampire Numbers

It is generally acknowledged that Vampire numbers are positive integers with an even number — we'll say $2n$ — of digits where the $2n$ digits can be distributed across two n-digit numbers such that their product equals the original $2n$-digit number. None of the three numbers can include leading zeroes, and neither of the two n-digit numbers can have consecutive zeroes anywhere.

For examples:

- 125460 = 204 x 615 (so 125460 is a Vampire number).
- 16758243290880 = 1982736 x 8452080 (so 16758243290880 is a Vampire number).
- 353 has an odd number of digits, so it can't be a Vampire number by definition.
- 3421 can't be subdivided properly, so it's not a Vampire number either.

Write a program that reads in a series of numbers (each at most 18 digits) and prints whether or not that number is a Vampire number.

Input

There will be an arbitrary number of inputs, one per line, with no leading zeroes or extraneous whitespace. Each number will have at most 18 digits. End of input is marked by a single `0` on its own line, for which no output should be produced.

Output

For each input, print the number, followed by a colon, followed by a space, followed by "`yes`" if the number is a Vampire number or "`no`" if it is not.

Sample Input	Sample Output
1260 6880 8680 102510 108135 110758 115672 116725 125248 12054060 13078260 46847902 46847921 1001795850 315987404670 472812953760 10174695862032 10174695862037 2512099504480801 8186379410403769 170147428389340249 189598345243224241 968781726110944201 968781726110944203 698781726110944201 0	1260: yes 6880: yes 8680: no 102510: yes 108135: yes 110758: yes 115672: yes 116725: yes 125248: yes 12054060: yes 13078260: yes 46847902: no 46847921: no 1001795850: yes 315987404670: yes 472812953760: yes 10174695862032: yes 10174695862037: no 2512099504480801: yes 8186379410403769: yes 170147428389340249: yes 189598345243224241: yes 968781726110944201: yes 968781726110944203: no 698781726110944201: no